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PTO/SB/21 (09-04)

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<h1 style="text-align: center;">TRANSMITTAL FORM</h1> <p style="text-align: center;">(to be used for all correspondence after initial filing)</p>		Application Number	10/577304
		Filing Date	April 28, 2006
		First Named Inventor	Hideaki Fujita
		Art Unit	N/A
		Examiner Name	N/A
Total Number of Pages in This Submission	1	Attorney Docket Number	65472 (70868)

## ENCLOSURES (Check all that apply)

<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Copy of English language translation of International Preliminary Report on Patentability (Chapter I) Certificate of Mailing Return Receipt Postcard
<div style="border: 1px solid black; padding: 5px; min-height: 40px;">Remarks</div>		

## SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	EDWARDS ANGELL PALMER & DODGE LLP		
Signature			
Printed name	David A. Tucker		
Date	September 1, 2006	Reg. No.	27,840

From the INTERNATIONAL BUREAU

**PCT**

NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY  
(CHAPTER I OR CHAPTER II  
OF THE PATENT COOPERATION TREATY)  
(PCT Rules 44bis.3(c) and 72.2)

To:

SAIKYO, Keiichiro  
Shikishima Building  
2-6, Bingomachi 3-chome  
Chuo-ku  
Osaka-shi, Osaka 5410051  
JAPON



Date of mailing (*day/month/year*)  
03 August 2006 (03.08.2006)

Applicant's or agent's file reference  
62119CT00488

**IMPORTANT NOTIFICATION**

International application No.  
PCT/JP2004/016009

International filing date (*day/month/year*)  
28 October 2004 (28.10.2004)

Applicant

SHARP KABUSHIKI KAISHA et al

**1. Transmittal of the translation to the applicant.**

The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

**2. Transmittal of the copy of the translation to the designated or elected Offices.**

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

None

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EA, EC, EE, EG, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

**3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).**

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

Yoshiko Kuwahara

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# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 62119CT00488	<b>FOR FURTHER ACTION</b>	See item 4 below
International application No. PCT/JP2004/016009	International filing date ( <i>day/month/year</i> ) 28 October 2004 (28.10.2004)	Priority date ( <i>day/month/year</i> ) 31 October 2003 (31.10.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant SHARP KABUSHIKI KAISHA		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 6 sheets, including this cover sheet.  In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application																							
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. +41 22 338 82 70	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Date of issuance of this report 24 July 2006 (24.07.2006)</td> </tr> <tr> <td style="padding: 5px;">Authorized officer  Yoshiko Kuwahara  e-mail: pt07@wipo.int</td> </tr> </table>	Date of issuance of this report 24 July 2006 (24.07.2006)	Authorized officer  Yoshiko Kuwahara  e-mail: pt07@wipo.int
Date of issuance of this report 24 July 2006 (24.07.2006)			
Authorized officer  Yoshiko Kuwahara  e-mail: pt07@wipo.int			

# PATENT COOPERATION TREATY

TRANSLATION

From the  
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing  
(day/month/year)

Applicant's or agent's file reference

**62119CT00488**

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

**PCT/JP2004/016009**

International filing date (day/month/year)

**28.10.2004**

Priority date (day/month/year)

**31.10.2003**

International Patent Classification (IPC) or both national classification and IPC

Applicant

**SHARP KABUSHIKI KAISHA**

1. This opinion contains indications relating to the following items:

- |                                     |              |  |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the opinion   |
| <input type="checkbox"/>            | Box No. II   | Priority   |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability   |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention   |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited  |
| <input checked="" type="checkbox"/> | Box No. VII  | Certain defects in the international application   |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application  |

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/016009

Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

## International application No.

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement			
<b>1. Statement</b>			
Novelty (N)	Claims	3, 6, 9-13, 16-18, 21-22	YES
	Claims	1-2, 4-5, 7-8, 14-15, 19-20	NO
Inventive step (IS)	Claims		YES
	Claims	1-22	NO
Industrial applicability (IA)	Claims	1-22	YES
	Claims		NO
<b>2. Citations and explanations:</b>			
<p>Document 1: US 6396082 B1 (FUKUSAWA et al.), 28 March 2002, column 3, line 62 to column 5, line 57; column 6, line 66 to column 7, line 11; Figs. 2-3</p> <p>The inventions of claims 1, 4-5, 15 and 19-20 do not appear to possess novelty over document 1 cited in the ISR. Document 1 describes mounting light-emitting diode element 29 on one face of substrate 22 (mounting body) that has through hole 25 filled with transparent resin part 27, sealing it with sealing resin 38 (sealing body) and mounting lens 46 (transparent body) made of transparent resin on the other face of substrate 22.</p> <p>The inventions of claims 6-8 and 14 do not appear to involve an inventive step over document 1 cited in the ISR. In the invention described in document 1, both sealing resin 38 (sealing body) and lens 46 (transparent body) are formed of resin; therefore forming these with transfer mold, which is well-known art in the relevant technical field, could easily be carried out by a person skilled in the art. Also, in the invention described in document 1, it is not clear whether or not lens 46 (transparent body) touches substrate 22 (mounting body), but if one considers light utilization efficiency, it would be obvious to a person skilled in the art that at least through hole 25 in substrate 22 needs to be completely covered with resin. Therefore forming lens 46 larger than the through hole so that its outer periphery touches substrate 22 would easily be carried out by a person skilled in the art.</p> <p>Document 2: JP 11-261109 A (Toshiba Corp.), 24 September 1999, paragraphs 0064, 0070-0071, Fig. 12</p> <p>The inventions of claims 1-2, 4-5, 7-8, 14-15 and 19-20 do not appear to possess novelty over document 2 cited in the ISR. Document 2 describes disposing light-emitting element 10 on the surface of light-transmitting mounting substrate 710 (mounting body) and molding light-emitting element 10 using resin 740 (sealing body) and disposing convex lens 760 (transparent body) on the rear surface, and describes that light is not extracted from resin 740 portion so an agent to prevent combustion may be introduced and that convex lens 760 may be integrated with mounting substrate 710 or separate.</p> <p>The inventions of claims 6 and 22 do not appear to involve an inventive step over document 2 cited in the ISR. In the invention described in document 2, resin 740 (sealing body) and convex lens 760 (transparent body) both appear to be formed of resin; therefore forming these with a transfer mold, which is well-known art in the relevant technical field, would easily be carried out by a person skilled in the art. Also, using a mold when doing resin molding would be obvious to a person skilled in the art. □</p>			

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/016009

Box No. VII      Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Line 14 of page 24 refers to "broken line 71", but this does not match what is in the corresponding Fig. 5.

"Light transmit down part 101" in lines 21-22 of page 25 appears to be a typographical error for "light transmittance part 101."

"Fig. 4(3)" in line 10 of page 34 appears to be a typographical error for "Fig. 4C."

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/016009

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V. 2

Document 3: JP 11-074424 A (Nitto Denko Corp.), 16 March 1999, paragraphs 0002-0004

The inventions of claims 2-3 and 22 do not appear to involve an inventive step over documents 1-3 cited in the ISR. Document 3 cites a document (JP 49-23847 A) published in 1974 as prior art; it describes art wherein, when resin-sealing an optical semiconductor element with epoxy resin, an inorganic powder is added that has a small linear expansion coefficient, such as silica powder, etc., and the linear expansion coefficient of the epoxy resin composition is made small and approximates that of the optical semiconductor element. Therefore this art and the problem of reducing the linear expansion coefficient of a mold resin appear to be well-known art and a well-known problem in the relevant technical field. Also, the point that this additive reduces the light transmission of resin appears to be well-known knowledge as it is described in document 3. This being the case, the sealing resins in the inventions described in documents 1 and 2 are both applied to the portion that does not constitute a light path, and the reduction in light transmission does not need to be considered. Therefore in the invention described in document 1 or 2, adding an additive (filling material) to the sealing resin in order to make the linear expansion coefficient of the sealing resin approximate that of the optical semiconductor element could easily be conceived of by a person skilled in the art.

Document 4: US 2002/011601 A1 (FURUKAWA et al.), 31 January 2002, paragraph 0132; Fig. 13

The invention of claim 9 does not appear to involve an inventive step over documents 1-2 and 4 cited in the ISR. Document 4 describes covering an entire LED lamp with a resin that forms a lens as ordinary art in the relevant technical field, and it would be obvious to a person skilled in the art that molding an entire device that includes this sort of optical semiconductor element of a single resin would be advantageous in terms of strength. Therefore, in the invention described in document 1 or 2, molding the entirety with the resin that forms the lens does not appear to present any special difficulty to a person skilled in the art.

Document 5: US 4995695 A (PINPINELLA et al.), 26 February 1991, column 5, line 13 to column 6, line 51; Fig. 5

The inventions of claims 10-13, 17-18 and 21 do not appear to involve an inventive step over documents 1-5 cited in the ISR. Document 5 describes mounting element 23 of a laser, an LED, a light detector, etc. on one face of transparent member 10 (mounting body) and forming tapered recess 12 (light transmission part) that widens toward the surface side on the other face of member 10 and supporting lens 50 (transparent body) in the recess with an adhesive, etc., and describes that element 23 and optical fiber 41 are optically coupled by lens 50. This being the case, in the invention described in document 1 or 2, adhering the transparent body to the mounting body with adhesive as in document 5 would easily be carried out by a person skilled in the art, and making the adhesive a light transmitting adhesive with a refractive index higher than that of air would be obvious to a person skilled in the art. Also, employing the art described in document 5 in the light transmitting part in the invention described in document 1 or 2 and applying the art described in document 1 or 2 to an optical coupler as described in document 5 would both easily be carried out by a person skilled in the art. Also, improving light utilization efficiency by high reflectance of a tapered surface in the light transmitting part constituting a light path is well-known art, as described in document 4 (see paragraphs 0057, 0132, Fig. 1, Fig. 13, etc.) and does not appear to be a special constitution.



